

What is claimed is:

1. A wave absorber comprising a structure which sequentially laminates a conduct layer composed of an electric conductor, a first dielectric layer composed of dielectric material in one layer or multiple layers, a high-resistance conductor layer having a surface resistivity within a prescribed range, a second dielectric layer composed of dielectric material in one layer or multiple layers, and a pattern layer having multiple patterns composed of an electric conductor; wherein each pattern in said pattern layer differs in either or both of size and form relative to another adjacent pattern.
2. The wave absorber according to claim 1, wherein the patterns in said pattern layer comprise loop patterns given a loop form; said loop patterns comprise conductors with a shape having a line width value that is 5 percent to 25 percent relative to the center line length which is the length of the center line of the pertinent loop pattern; the center line lengths of said loop patterns are lengths that are from 60 percent to 140 percent of the wavelength of the EM waves that are the object of absorption; and any one loop pattern in said pattern layer and another loop pattern adjacent to the pertinent loop pattern differ in said center line lengths.
3. The wave absorber according to claim 1, wherein the center line lengths of said loop patterns are lengths that are from 60 percent to 140 percent of the wavelength of the EM waves that are the object of absorption; and any one loop pattern in said pattern layer and another loop pattern adjacent to the

pertinent loop pattern differ in form.

4. The wave absorber according to claim 1, wherein at least one of said loop  
patterns in said pattern layer has a form where a projecting form is provided on a portion  
5 of the lines in loop form.

5. The wave absorber according to claim 1, wherein the loop patterns in said  
pattern layer are such that an aggregate of multiple loop patterns of differing form or size  
constitutes one unit, and the space between the pertinent units is disposed at a prescribed  
10 interval.

6. The wave absorber according to claim 1, comprising a configuration where a  
protective layer is laminated onto at least one of the surface sides of said conduct layer  
and pattern layer.

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7. The wave absorber according to claim 1, wherein the surface resistivity of said  
high-resistance conductor layer is in a range from  $100 \Omega/\square$  to  $100 \text{ k}\Omega/\square$ .

8. The wave absorber according to claim 1, wherein the ratio of the thicknesses of  
20 said first dielectric layer and second dielectric layer is in a range from 0.1 to 10.

9. The wave absorber according to claim 1, wherein said conduct layer is a  
low-resistance conductor layer with a surface resistivity of  $10 \Omega/\square$  or less.

25 10. The wave absorber according to claim 1, wherein said conduct layer is a

grid-like conductor layer configured from a grid-like pattern.

11. The wave absorber according to claim 10, wherein said grid-like conductor layer has a line width of 100  $\mu\text{m}$  or less, and a line center interval that is 1/16 or less of the wavelength of the EM waves that are the object of absorption.

12. The wave absorber according to claim 1, wherein the conductors used in said conduct layer, high-resistance conductor layer and pattern layer are composed of optically transparent conductive material,  
10 and said first and second dielectric layer and protective layer are composed of optically transparent dielectric material.

13. The wave absorber according to claim 1, wherein at least one layer among said high-resistance conductor layer, first dielectric layer and second dielectric layer is  
15 composed of dielectric material containing conductive oxide.

14. The wave absorber according to claim 13, wherein said conductive oxide is dielectric material containing ATO (antimony tin oxide).

20 15. The wave absorber according to claim 1, wherein at least one layer among said high-resistance conductor layer, first dielectric layer and second dielectric layer is composed of dielectric material containing conductive carbon powder.

16. The wave absorber according to claim 15, wherein at least one layer among said  
25 high-resistance conductor layer, first dielectric layer and second dielectric layer is

composed of dielectric foam material containing conductive carbon powder.

17. The wave absorber according to claim 15, wherein only said high-resistance conductor layer is composed of dielectric material containing conductive carbon powder.

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18. The wave absorber according to claim 15, wherein at least one layer among said high-resistance conductor layer, first dielectric layer and second dielectric layer is composed of dielectric material containing conductive carbon powder where carbon powder content differs among the pertinent high-resistance conductor layer, first

10 dielectric layer and second dielectric layer.

19. A wave absorber comprising at least a conduct layer composed of a conductor, a first dielectric layer composed of dielectric material in one layer or multiple layers, a linear pattern resistance layer having linear patterns composed of a high-resistance  
15 conductor which is a conductor having a higher resistivity than said conduct layer, a second dielectric layer composed of dielectric material in one layer or multiple layers, and a pattern layer having multiple patterns composed of a conductor.

20. The wave absorber according to claim 19, wherein said conduct layer, said first  
20 dielectric layer, said linear pattern resistance layer, said second dielectric layer, and said pattern layer are laminated in the pertinent order.

21. The wave absorber according to claim 19, wherein said conduct layer, said first dielectric layer, said pattern layer, said second dielectric layer, and said linear pattern  
25 resistance layer are laminated in the pertinent order.

22. A wave absorber comprising a structure where at least  
a grid-like conductor layer formed into a grid by patterns composed of a conductor,  
a first dielectric layer composed of dielectric material in one layer or multiple layers,  
5 a linear pattern resistance layer having linear patterns composed of a high-resistance  
conductor which is a conductor with a higher resistivity than the conductor that forms  
said grid-like conductor layer,  
a second dielectric layer composed of dielectric material in one layer or multiple layers,  
and a pattern layer having multiple patterns composed of a conductor are laminated in the  
10 pertinent order.

23. The wave absorber according to claim 19 or 22, wherein said linear pattern  
resistance layer is configured either by having linear patterns composed of a  
high-resistance conductor intersect, or by forming said linear patterns into a hexagonal  
15 honeycomb shape.

24. The wave absorber according to claim 19 or 22, wherein the high-resistance  
conductor constituting said linear pattern resistance layer has a volume resistivity that is  
1.0 E-4  $\Omega$ cm or more and 1.0 E-1  $\Omega$ cm or less.

25. The wave absorber according to claim 19 or 22, wherein at least one among said  
conduct layer, pattern layer, linear pattern resistance layer and grid-like conductor layer  
has multiple linear patterns, where the line center interval which is the center interval of  
said linear patterns that are adjacent is 1/16 or less of the wavelength of the EM waves  
25 that are the object of absorption.

26. The wave absorber according to claim 25, wherein the line width which is the width of said linear pattern resistance layer is 100  $\mu\text{m}$  or less.

5 27. The wave absorber according to claim 19 or 22, wherein each pattern of said pattern layer differs in at least one or the other of size and form relative to another adjacent pattern.

28. The wave absorber according to claim 19 or 22, wherein each pattern of said  
10 pattern layer is configured to have at least one or the other of a form that is any one of circular, rectangular, polygonal or a loop form having these forms as its external form, and a form that adds a projecting form to the pertinent one of these forms.

29. The wave absorber according to claim 19 or 22, which has a protective layer  
15 laminated onto at least one or the other of the front face and rear face of the laminate structure.

30. The wave absorber according to claim 19 or 22, wherein all of said component layers are made transparent or semi-transparent.

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31. A wave absorber manufacturing method comprising a process of laminating a radio wave reflection layer composed of a conductor that reflects EM waves, a first dielectric layer composed of dielectric material in one layer or multiple layers, a linear pattern resistance layer having linear patterns composed of a high-resistance conductor  
25 which is a conductor with a higher resistivity than said radio wave reflection layer, a

second dielectric layer composed of dielectric material in one layer or multiple layers,  
 and a pattern layer having multiple patterns composed of a conductor,  
 and a process of forming the linear patterns of said linear pattern resistance layer using  
 the screen printing method.

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32. A wave absorber manufacturing method comprising a process of laminating a  
 radio wave reflection layer composed of a conductor that reflects EM waves, a first  
 dielectric layer composed of dielectric material in one layer or multiple layers, a linear  
 pattern resistance layer having linear patterns composed of a high-resistance conductor  
 10 which is a conductor with a higher resistivity than said radio wave reflection layer, a  
 second dielectric layer composed of dielectric material in one layer or multiple layers,  
 and a pattern layer having multiple patterns composed of a conductor,  
 and a process of forming the linear patterns of said linear pattern resistance layer using  
 the ink jet method.

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33. A wave absorber comprising at least:  
 a conduct layer composed of a conductor,  
 a first dielectric layer composed of dielectric material in one layer or multiple layers,  
 a planar resistance layer composed of dielectric material containing conductive powder,  
 20 a second dielectric layer composed of dielectric material in one layer or multiple layers,  
 and a pattern layer having multiple patterns composed of a conductor.

34. The wave absorber according to claim 33, wherein The wave absorber according  
 to claim 33, wherein said conduct layer, said first dielectric layer, said planar resistance  
 25 layer, said second dielectric layer, and said pattern layer are laminated in the pertinent

order.

35. The wave absorber according to claim 33, wherein said planar resistance layer is composed of material where glass cloth is impregnated with epoxy resin in which  
5 conductive powder such as carbon, silver, nickel or the like has been dispersed.

36. The wave absorber according to claim 33, wherein each pattern of said pattern layer differs at least in one or the other of size and form relative to another adjacent pattern.

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37. The wave absorber according to claim 33, wherein each pattern of said pattern layer is configured to have at least one or the other of a form that is any one of circular, rectangular, polygonal or a loop form having these forms as its external form, and a form that adds a projecting form to the pertinent one of these forms.

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38. The wave absorber according to claim 33, which has a protective layer laminated onto at least one or the other of the front face and rear face of the laminate structure.

20 39. A wave absorber manufacturing method comprising a process of laminating a conduct layer composed of a conductor, a first dielectric layer composed of dielectric material in one layer or multiple layers, a planar resistance layer composed of dielectric material containing conductive powder, a second dielectric layer composed of dielectric material in one layer or multiple layers, and a pattern layer having multiple patterns  
25 composed of a conductor,



and a process of forming a prepreg wherein, with respect to said planar resistance layer, said first dielectric layer and said second dielectric layer are bonded with interposition of the pertinent planar resistance layer.

5     40.     The wave absorber manufacturing method according to claim 39, wherein said planar resistance layer is formed by using at least a process where glass cloth is impregnated with epoxy resin in which conductive powder such as carbon, silver and nickel has been dispersed.

10     41.     A wave absorber comprising a structure wherein there is sequential lamination of at least a conduct layer composed of an electric conductor, a first dielectric layer composed of dielectric material in one layer or multiple layers, a high-resistance conductor layer having a surface resistivity within a prescribed range, a second dielectric layer composed of dielectric material in one layer or multiple layers, and a pattern layer  
15     having multiple patterns composed of an electric conductor, and comprising a configuration wherein a protective layer which may be interposed as necessary is laminated onto at least one surface side of said conduct layer and pattern layer.

20     42.     A wave absorber comprising a structure wherein there is sequential lamination of a conduct layer composed of an electric conductor, a first dielectric layer composed of dielectric material in one layer or multiple layers, a high-resistance conductor layer having a surface resistivity within a prescribed range, a second dielectric layer composed of dielectric material in one layer or multiple layers, and a pattern layer having multiple  
25     patterns composed of an electric conductor, and

comprising a configuration wherein a protective layer which may be interposed as necessary is laminated onto at least one surface side of said conduct layer and pattern layer, wherein  
each pattern of said pattern layer differs in either or both of size and shape relative to  
5 another adjacent pattern.

43. The wave absorber according to claims 41 or 42, wherein the surface resistivity of said high-resistance conductor layer is in a range from  $100 \Omega/\square$  to  $100 \text{ k}\Omega/\square$ .

10 44. The wave absorber according to claims 41 or 42, wherein said high-resistance conductor layer is composed of conductive oxide material.

45. The wave absorber according to claim 44, wherein said high resistance conductor layer is composed of ITO (indium tin oxide), which is a conductive oxide  
15 material.

46. The wave absorber according to claims 41 or 42, wherein said high resistance conductor layer is composed of carbon material having conductivity.